

What is claimed is:

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## CLAIMS

1. A hydrogen recharging system for fuel cell hydride storage reservoirs, comprising:

5 an electrolyzer to hydrolyze liquid water to hydrogen gas and oxygen gas, said electrolyzer connected to a water supply;

a hydrogen gas accumulator;

10 a dryer situated between and connected to the electrolyzer and the accumulator; and

wherein hydrogen gas produced by the electrolyzer is dried in the dryer and then stored in the accumulator such that when a user connects the fuel cell hydride storage reservoir to the hydrogen recharging system, the stored  
15 hydrogen gas is rapidly transferred from the accumulator to the hydride storage reservoir, to be retained in the hydride storage reservoir in the form of a metal hydride.

2. The system as described in claim 1, further  
20 comprising a heat exchanger to cool the connected fuel cell hydride storage reservoir during transfer of the stored hydrogen.

3. The system as described in claim 1, further  
25 comprising a heat exchanger to heat the connected fuel cell hydride storage reservoir prior to transfer of the stored hydrogen, and wherein a pump is used to evacuate the fuel cell hydride storage reservoir during heating.

30 4. The system as described in claim 1, wherein a pump is used to evacuate the fuel cell hydride storage reservoir.

5. The system as described in claim 4, further  
35 comprising a heat exchanger to heat the connected fuel cell hydride storage reservoir during evacuation of the reservoir, and then to cool the connected fuel cell

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hydride storage reservoir during transfer of the stored hydrogen.

6. The system as described in claim 1, further  
5 comprising a vent on the electrolyzer to vent oxygen  
produced by the electrolyzer to the surrounding  
environment.

7. The system as described in claim 1, wherein the  
10 accumulator further comprises a compressor.

8. The system as described in claim 1, further  
comprising a charge meter for measuring the amount of  
hydrogen transferred to the fuel cell hydride storage  
15 reservoir.

9. The system as described in claim 1, wherein the  
system is contained in a desktop housing less than or  
equal to one cubic foot in volume.  
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10. A self-contained hydrogen recharging system for a fuel cell metal hydride storage reservoir, comprising:

5 a water supply connected to an electrolyzer for  
converting liquid water to hydrogen and oxygen gas;  
hydrogen storage means comprising an accumulator and a compressor;  
a dryer situated after the electrolyzer; and  
wherein hydrogen gas produced by the electrolyzer is  
10 stored in the hydrogen storage means;  
a heat exchanger to heat the fuel cell hydride storage reservoir prior to transfer of the stored hydrogen gas, and then to cool the fuel cell hydride storage reservoir during transfer of the stored hydrogen gas; and  
15 wherein upon connection of the fuel cell hydride storage reservoir to the hydrogen recharging system by a user, the stored hydrogen gas is rapidly transferred to the hydride storage reservoir and stowed in the reservoir as a metal hydride.

20 11. The system as described in claim 7, further comprising a vent on the electrolyzer to vent oxygen produced by the electrolyzer to the surrounding environment.

25 12. The system as described in claim 7, further comprising a charge meter for measuring the amount of hydrogen transferred to the fuel cell hydride storage reservoir.

30 13. The system as described in claim 7, further comprising a vacuum pump.

14. A hydrogen recharging system for fuel cell  
hydride storage reservoirs, comprising:

5 an electrolyzer to hydrolyze liquid water to hydrogen  
gas and oxygen gas, said electrolyzer connected to a water  
supply;

a hydrogen gas accumulator; and

10 wherein hydrogen gas produced by the electrolyzer is  
stored in the accumulator such that when a user connects  
the fuel cell hydride storage reservoir to the hydrogen  
recharging system, the stored hydrogen gas is rapidly  
transferred from the accumulator to the hydride storage  
reservoir, to be retained in the hydride storage reservoir  
in the form of a metal hydride.

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